



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,537	09/14/2005	Hans Vondracek		4431

Max Fogiel
44 Maple Court
Highland Park, NJ 08904

7590 12/27/2007

EXAMINER

CHEN, CHRISTINE

ART UNIT	PAPER NUMBER
----------	--------------

4116

MAIL DATE	DELIVERY MODE
-----------	---------------

12/27/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/551,537	Applicant(s) VONDRACEK ET AL.	
	Examiner CHRISTINE CHEN	Art Unit 4116	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 19,20,22 and 23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18,21 and 24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election Acknowledged

1. Applicant's election with traverse of spring steel (claim 18) and wound into a coil spring (claim 21) in the reply filed on November 9, 2007 is acknowledged. While the examiner acknowledges claim 1 as being a generic claim, the election of species still stands. The traversal is not found to be persuasive because the species do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features for the following reasons: For the category involving the starting material, the species listed are all different types of steel, in which the combinations of elements composing the steel vary. As a result, the species would require different searches, creating a burden for the examiner. Similarly, for the category involving the change in shape of the skew-rolled, approximately straight rod, the species would require different searches, creating a burden for the examiner.

The requirement is still deemed proper and is therefore made FINAL.

Status of Application

Claims 1-24 are pending. Claims 19, 20, 22, and 23 were not elected and are thus withdrawn. The remainder of the claims, 1-18, 21, and 24 are presented for examination.

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Specification

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a

Art Unit: 4116

nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

1. Claims 10 and 15 are objected to because of the following informalities: In claim 10, the symbol Ψ is used but not defined in the claim. In claim 15, the range of 700-100°C is not supported by the specification. Appropriate correction is required.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. The term "approximately" in claims 1, 22, and 23 is a relative term which renders the claim indefinite. The term "approximately" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3, 5-8, 10-11, 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo (US 5,873,960 hereinafter A1).

Claim 1 is drawn to a method for the thermomechanical treatment of steel.

Claims 3, 5-8, 10-11, 15 and 17 depend on claim 1.

In regards to claim 1, Kondo (A1) teaches a method for manufacturing a steel product involving thermomechanical treatment. The method includes a step of heating the billet to a temperature which allows piercing of the billet, a step of piercing, a step of elongating and finish rolling the steel, a step of recrystallizing the steel at a temperature of not lower than an A_{r3} transformation temperature, a step of quenching the steel from a temperature not lower than an A_{r3} transformation temperature, and a step of tempering the steel (abstract). In addition, the starting material is a rounded billet (abstract) and in piercing, a skew-roll piercing mill is used (col. 5, li. 9).

While Kondo (A1) does not teach the twisting of the material, Kondo (A1) teaches the elongating and finish rolling of the steel (abstract). Both actions involve a change in shape of the material, therefore it would have been obvious to substitute the elongating and finish rolling with the twisting of steel, depending on the desired shape of the final product.

In regards to claim 3, Kondo (A1) teaches that the heating temperature in heating the billet is generally in the range between 1100-1300°C (col. 6, li. 50-51). While this is not the case in claim 3, Kondo (A1) also teaches "the optimum temperature depends on the material, and is determined considering characteristics of the material to be pierced, including high temperature ductility and high temperature strength (col. 6, li. 46-50)." Therefore claim 3 would be obvious as a case of routine optimization.

Put another way, Kondo (A1) teaches the heating temperature to be an art recognized result effective variable. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the heating temperature. In

Art Unit: 4116

addition, it would have been obvious to one of ordinary skill in the art at the time of the invention to choose the instantly claimed ranges through process optimization, since it has been held that the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See In re Boesch, 205 USPQ 215 (CCPA 1980).

In regards to claims 5 and 6, Kondo (A1) discloses, "by adjusting the temperature of the steel pipe, differences in the quenching temperature in the longitudinal direction of the pipe and among manufacturing lots can be minimized (col. 5, li. 28-31)." This being the case, it is well known and desired in the art that the temperature difference over the length of a pipe be minimized. Therefore, the temperature difference over the length of the rod as well as the duration of time over which this takes place would be obvious as a case of routine optimization.

Claim 7 is drawn to the method of claim 1, characterized in that the heating temperature of the rod is kept constant virtually up to its entry into the roll gap. While Kondo (A1) makes no direct mention of this, Kondo (A1) teaches the heating of the billet to a temperature which allows piercing of the billet (abstract). This being the case, Kondo (A1) places a temperature limitation on the billet similar to claim 7. In addition, it is reasonable that one would want the heating temperature of the rod kept constant, as this would support stability within the billet.

Claim 8 is drawn to the method of claim 1, characterized in that the transformation is performed by skew rolling in one step. While Kondo (A1) teaches the transformation in two steps, piercing, and elongating and finish rolling, this is because

Art Unit: 4116

the desired end product of Kondo's method is a steel pipe. It would have been obvious to one of ordinary skill in the art to have the transformation by skew rolling in one step based on the desired end product. In addition, one would be motivated to have the transformation in one step in order to decrease production time.

In regards to claim 10, seeing how Kondo (A1) teaches a similar method to claim 1, with the addition of the step of elongation and finish rolling, a broad interpretation of Kondo (A1) would render the claim obvious. While Kondo (A1) does not make a direct mention of the maximum transformation, due to the fact that Kondo (A1) teaches a very similar process, this covers the limitation of the maximum transformation range.

In regards to claim 11, it is obvious to place a temperature limitation on the location temperature elevation, as this would support stability within the billet.

In regards to claim 15, Kondo teaches, "the temperature of a hollow shell which has passed through this piercing step is normally between 1050-1250°C (col. 7, li. 40-43)." While claim 15 is drawn to a temperature range of 700-100°C, Kondo teaches that the temperature at which the skew rolling is performed varies depending on the material, piercing conditions, etc.

In regards to claim 17, it is obvious to place a limitation on the temperature difference over the rod length as this would support stability within the billet.

3. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo (A1) in view of Bilgen (US 6,458,226 hereinafter A2).

While Kondo (A1) supports a prima facie case of obviousness for claim 1, Kondo does not teach the heating rate of the material. Bilgen (A2) however in the teaching of a process for the thermomechanical treatment of steel, discloses a heating rate of at least 50 K/s (abstract), which overlaps with the temperature range specified in claim 2, 100-400 K/s. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kondo (A1) with the heating rate of Bilgen (A2) as it is effective in achieving the desired effect in a timely manner.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo (A1) in view of Kondo (US 5,938,865 hereinafter A3).

While Kondo (A1) supports a prima facie case of obviousness for claim 1, Kondo (A1) does not teach that the heating is performed inductively. However, in another patent, Kondo (A3) teaches the use of an induction heater (col. 19, li. 30-33) in a method for the thermomechanical treatment of steel. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kondo (A1) with the inductive heating taught by Kondo (A1) as it is a well known form of heating for the thermomechanical treatment of steel.

5. Claims 9, 16 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo (A1) in view of Staat (US 4,798,071 hereinafter A4).

While Kondo (A1) supports a prima facie case of obviousness for claim 1, Kondo (A1) does not teach the degree of stretching in that the skew rolling of the rod is

Art Unit: 4116

performed or the adjustment of the rolls of the skew rolling stand. It is well known in the art that the stretching process is carried out in the region of the rolls of the skew-rolling stand (Staat col. 1, li. 50-54). This being the case, a limitation as to the degree of stretching performed is obvious.

In regards to claim 16, Staat (A4) discloses that “the position of the rolls and possibly the position of the guides of the skew-rolling stand can be adjusted at will after each passage to piercing or stretching (col. 3, li. 31-34)”. This is for a steel pipe, a product in which a uniform distribution is desired. This being the case, it would have been obvious to one of ordinary skill to adjust the rolls during the piercing or stretching step in order to achieve a rod of varying diameter over its length.

In regards to claim 14, a rod of varying diameter over its length would have a property profile as a result of the structural distribution.

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo (A1) in view of Poerink (US 3,988,915 hereinafter A5).

While Kondo (A1) supports a prima facie case of obviousness for claim 1, Kondo (A1) does not teach that the direction of the twisting corresponds to the main direction of tension of a component stressed by torsion.

Poerink (A5) however teaches that torsion goes in the same direction as the direction of the rotary motion of a coiling spindle (col. 12), which overlaps with claim 12^[el1].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kondo (A1) in view of Poerink (A5) to receive the desired end product involving the twisting of steel.

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo (A1) in view of Poerink (A5) and further in view of Seale (US 6,341,767 hereinafter A6).

While Kondo (A1) in view of Poerink (A5) support a prima facie case of obviousness for claim 12, they fail to teach the twist angle of the structure. Seale (A6), however, in teaching a spring, discloses that it is well known that the twist angle is dependent on the shear modulus and the radius of the circular wire (col. 9, li. 1-5). [el2]

Put another way, Seale (A6) teaches the twist angle to be an art recognized result effective variable. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the twist angle. In addition, it would [el3]have been obvious to one of ordinary skill in the art at the time of the invention to choose the instantly claimed ranges through process optimization, since it has been held that the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See In re Boesch, 205 USPQ 215 (CCPA 1980).

8. Claims 18, 21, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo (A1) in view of Kuroda (US 6,372,056 hereinafter A7).

Art Unit: 4116

While Kondo (A1) supports a prima facie case of obviousness for claim 1, Kondo (A1) fails to disclose that the starting material is spring steel and that the skew-rolled, approximately straight rod is wound into a coil spring.

Kuroda (A7) however, teaches "a process for making [the] spring steel into wire rods for good springs (abstract)." This overlaps with claims 18 and 21.

While Kuroda (A7) does not directly teach the performance of winding and/or bending while it is hot, it is well known in the art that it is a hot temperature will aid in the winding and/or bending of a material, particularly a metal.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kondo (A1) in view of Kuroda with the winding and/or bending of the material while it is hot, as the temperature aids in the ductility of the material.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTINE CHEN whose telephone number is (571)270-3590. The examiner can normally be reached on Monday-Friday 8:30am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on (571) 272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 4116

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CC

/Vickie Kim/

Supervisory Patent Examiner, Art Unit 4116